

# SNAPSHOT: SOIL, AIR AND WATER RESOURCES

## 1 Status

- Soil productivity on the western part of the Forest is often limited by factors such as cold soil temperatures, limited precipitation, abundant rock fragments in the soil, and shallow soil depths.
- Soil productivity on the Ashland and Sioux Districts is restricted by limited soil moisture in most areas and by shallow soils on steep slopes, ledge or plateau areas. The well-developed soils are limited by annual precipitation.
- There are no Class I airsheds on the Custer-Gallatin NF. Class II airsheds include the Lee Metcalf and Absaroka Beartooth Wilderness Areas which are protected by Federal and State Laws including the Wilderness Act.
- Watershed condition is largely 'properly functioning' across the Forest. No watersheds are rated as non-functioning.
- Long-term habitat monitoring data for the western part of the Forest indicates stream habitat conditions are largely holding steady or showing improvements.
- Native fish restoration is succeeding on the western part of the Forest, expanding ranges and stabilizing populations, particularly for cutthroat trout.
- These cutthroat trout expanded populations appear reasonably buffered against climate change, based on climate projection, over the likely life of a revised Forest Plan.

## 2 Trends

- Haze due non-fire sources has decreased, thereby improving visibility in the Greater Yellowstone Area.
- There is less Sulphur in the air so less deposits on the land and water.
- More nitrogen is in the air, so more deposits on the land and water, especially on the western portion of the Forest.
- Nitrogen deposition is beginning to affect high elevation sensitive ecosystems.

## 3 Information Gaps

- More research and monitoring quantifying deposition from air pollution east of the Absaroka-Beartooth Range is needed.
- More monitoring and analysis is needed to assess hotspots of nitrogen and other pollutants such as sulfur, mercury, and metals and to understand component of air pollutants released from wildland fires beyond particulate matter.
- How deposition loading from air pollution in addition to changing climate interacts to put an increasing stress on resources such as high elevation plant communities, native plants, and sensitive water bodies.
- Data gaps for the Ashland and Sioux Districts:
  - Fish species distribution data, both spatially and temporally, are sporadic
  - Flow regime characterization is incomplete, especially temporally
  - Stream habitat fragmentation information is incomplete
  - Long-term stream habitat monitoring data are non-existent, including temperature trends in perennial stream reaches
  - Climate change projections and vulnerability assessments are largely lacking at meaningful management scales
- Data gaps for the western portion of the Forest:
  - Complete fish distribution surveys to further understand native species current distribution and possible restoration possibilities
  - Understanding the role and extent of glaciers and more permanent snowpack to hydrology of montane streams
- Existing soil surveys vary in coverage and quality.

## 4 Need to Change Existing Forest Plans

- Allow flexibility in order to act on the most current and best available science which in part will drive monitoring and indicator use accordingly.
- Identify desired conditions, current monitoring and monitoring needs. Identify air quality indicators and critical loads.
- Identify information gaps and air quality monitoring questions.
- Consistent direction for retention of coarse woody debris in activity areas.
- Unify watershed direction, including for interaction of floodplains and riparian areas, across the Forest.
- Allow flexibility in order to use the most current and best available science and tools, as well as to respond to emerging issues such as climate change.
- Direction on the sustainable management of groundwater, springs, wetlands, riparian areas, and perennial waters and their interconnections.